
11-2 - NEW INTERPRETATIONS ON THE REINDEER HILLS MÉLANGE USING STRUCTURAL AND GEOCHRONOLOGICAL DATA



Wednesday, 15 May 2024



9:00 AM - 5:30 PM



Grand Ballroom (Davenport Grand Hotel)

Booth No. 36

Abstract

The North American Cordillera formed by protracted subduction that led to the accretion of multiple exotic terranes during the Mesozoic. Subduction and terrane accretion are recorded throughout the Cordillera by fault-bounded mélange belts exposed between disparate terranes. South of the Denali fault in central Alaska, the Reindeer Hills Mélange (RHM) consists of pervasively sheared carbonate, ultramafic, and sandstone blocks in a shale and chert-breccia matrix. The presence of these oceanic rock types and correlation with nearby Cretaceous flysch has led to the interpretation that the RHM formed by subduction of oceanic lithosphere during the Cretaceous. However, the age of the RHM and its genetic relationship to surrounding terranes remain unclear.

New structural and kinematic analysis along a ~5 km across-strike transect through the RHM reveals a steeply N-dipping penetrative cleavage, and asymmetric sandstone blocks in the shale matrix record distributed top-to-the-south shear. Detrital zircon U-Pb geochronology of grains taken from a sandstone block at the southern end of the transect present a dominant population of Silurian-Devonian grains that yield a youngest statistical population maximum depositional age of 416 +/- 6 Ma. Abundant Proterozoic grains ranging from 900-2000 Ma permit sediment input from peri-Laurentian sources, yet a distinctive population of 1450-1500 Ma grains may suggest input from Baltica basement or other Baltica-derived terranes recognized in the Cordillera (e.g., Alexander, Farewell). The new age data, along with Silurian-Devonian fossils from limestone blocks in the mélange and our recognition of Triassic diabase dikes that crosscut the mélange fabric, suggest that deposition and imbrication of Reindeer Hills clastic sediments took place in the Paleozoic. The new U-Pb data, Triassic mafic dikes, and published displacement estimates for the Denali fault suggest that the RHM correlates with the Mirror Creek Formation northeast of the Denali Fault in western Yukon, Canada, and may also have a link to Silurian-Devonian igneous rocks in the Alexander terrane of southeast Alaska. Altogether, the preliminary data presented here suggest that the RHM provides a record of early Devonian(?) subduction spatially associated with other Baltica-derived Cordilleran terranes.

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